

## **Analysis of Determinants of Capital Structure: With Special Reference to Indian Listed Non-Financial Companies in S and P CNX Nifty**

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### **ABSTRACT**

The objective of this paper is to investigate the determinants of the capital structure of CNX Nifty 50 Index Companies in India. The focus of this is to examine different quantify the capital structure. There are various determinants mentioned which affect the capital structure of the firm and there are possibly responsible for decision making of the capital Structure as per theories. In this paper, the selection of variables is based on the available alternative theories and previous research works, such independent variables are assets structure, profitability, growth, opportunities, company size, dividend policy and liquidity which affects to the dependent variables such as DR (debt ratio), STDR (short term debt ratio) and LTDR (long term debt ratio). To study the capital Structure determinants, all the non-financial companies of CNX Nifty Index considered. The period is selected from 2004 to 2013. All relevant data is collected from moneycontrol.com analyzed through t-test and correlation and finds that pecking theory in capital structure decision followed, with some support for the trade-off theory.

**Keywords:** capital structure, leverage, pecking order theory, trade-off theory.

### **INTRODUCTION AND LITERATURE**

When the firm chooses a certain proportion of debt and equity to finance its

assets, all that it does is to divide up the cash flows among investors. Modigliani and Miller (1958) were the first ones to landmark the topic of capital structure and they argued that capital

structure was irrelevant in determining the firm's value and its future performance. The irrelevance theory states that if a company's investment policy is given, then in a world of perfect markets (without taxes, transaction costs, bankruptcy costs etc.) the level of debt in a firm's capital structure not affects the value of a firm (Chen, 2004; Modigliani & Miller, 1958). On the other hand Lubatkin and Chatterjee (1994) as well as many other studies have proved that there exists a relationship between capital structure and firm value. Jianjun Miao (2005) provided an equilibrium model to test the relationship between optimal capital structure and industry dynamics. The study revealed that while the firms make financing and investment decisions subject to idiosyncratic technology shocks, it proved that the capital structure decisions reflect the tradeoff between tax benefits of the debt component and associated bankruptcy and agency costs. The earlier studies on capital structure mainly focuses on the analysis of certain firm characteristics – e.g., profitability, tangibility, size, etc. – as determinants of leverage. In addition, capital structure may vary across time (e.g., Korajczyk and Levy, 2003), which suggests the existence of an optimal level of leverage. Rajan, R.G., and L. Zingales, (1995) found that the leverage decision of the firms across countries was fairly similar and the factors identified by earlier studies in the US were similarly correlated with other countries, also found that the theoretical propositions of capital structure decisions were still unresolved. Brav (2009) analyses the data from public and private firms, and finds that private firms have a heavy dependence on debt financing and are more sensitive to performance changes when it comes to deciding on the capital structure, and desire to maintain control and possible information asymmetry have resulted in private equity being costlier than public equity.

The firms are more preferred the external debt financing over the internal debt. Tradeoff theory urges that internal finance are less available due to low liquidity and firms prefer to rely on external finance, and hence companies with low liquidity tend to adopt external financing. We examined different dependent variables of the capital structure such as debt ratio, short term debt ratio and long term debt ratio, and number of independent variables such as assets structure, profitability, growth opportunities, liquidity, company size and dividend policy.

Capital Structure Theories: Basic theories analyse in my paper Ali, M.S. *et al.* (2013) these are:

**Miller & Modigliani theory (MM):** Miller & Modigliani (1958) negligible theorem stated that, under certain conditions, the value of the firm is independent of its capital structure. The theory is regarded as the founding of modern theory of capital structure. In perfect capital market conditions, MM assumed that transaction costs bankruptcy cost and taxation become irrelevant in financing decision and consequently the capital structure become irrelevant to firm's value.

**Static Trade -off Theory (STT):** The static trade-off theory assumed that the firm sets a target debt-equity ratio and eventually move toward achieving this target. The theory suggests the existence of a target optimal capital structure within the firm tries to reach by balancing its investment and financing plans. One other major cost factor consists of agency costs. Agency costs stem from conflicts of interest between the different stakeholders of the firm and because of ex post asymmetric information (Jensen and Meckling (1976) and Jensen (1986)). Other factors that are related to this decision include bankruptcy cost, when a firm raises excessive debt to finance its operations.

**Pecking order theory:** Myers and Majluf (1984), states that firms follow a hierarchy of financial decisions when establishing its capital structure. Thus according to POT the profitable firms are less likely to incur debt for new projects because they have the available internal funds for this purpose. The reason firms are reluctant to issue equity is because of asymmetric information between the management and the new stockholders. Myers and Majluf (1984) pointed out underpricing would be the result of less information held by potential investors vis-à-vis management with respect to the expected cash flows from the firm's assets, both current and future.

**Agency Theory:** Berle and Means (1932) initially developed the agency theory and they argued that there is an increase in the gap between ownership and control of large organisations arising from a decrease in equity ownership. The duty of top managers is to manage the company in such a way that returns to shareholders are maximized thereby increasing the profit figures and cash flows (Elliot, 2002). However, Jensen and Meckling (1976) explained that managers do not always run the firm to maximise returns to the shareholders. Jensen and Meckling (1976, p. 308) states that "An agency relationship is a contract under which one or more persons (principal) engage another person (agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent". Pinegar and Wilbricht (1989) discovered that principal-agent problem can be dealt with to some extent through the capital structure by increasing the debt level and without causing any radical increase in agency costs. Similarly, Lubatkin and Chatterjee (1994) argue that increasing the debt to equity ratio will help firms ensure that managers are running the business more efficiently. The authors say "We show that the capital structure decision affects traders'

incentives to acquire information and subsequently, the distribution of informed traders across debt and equity claims. It also provides new implications for financial system design and for the relationship among leverage, liquidity premium, profitability, and the cost of information acquisition.

## METHODOLOGY

**Source of Data:** We try to examine out the leverage use of the firms. For this, the data related to income statement and balance sheet are from the annual reports of the firms and from a database maintained by moneycontrol.com and as per the Indian Accounting Standards. The total number of firms included in the study is listed (covered in calculation of NSE Nifty Indices, on the basis of capitalization) firms from S&P CNX Nifty Index, which they cover different non-financial industries. Financial firms (firms includes banks) were excluded on the basis of the fact that their nature of capital structure is different compared to non-financial firms.

**Data Description:** The selected data included, in total, 42 companies belonging to twenty one industries. Industries with the more numbers of representative companies were: pharmaceuticals, cement and cement products, computers software and construction. The data covers ten years from 2004-2013. There is at least one potential caution in the data we should worry about that two Companies were listed in year 2006, therefore their data is available after 2006. Nifty is benchmark index for Indian Equity Market. Nifty is free float market capitalization weighted index.

However in order to test the statistical significance of the model and the hypothesis, Sig. F (also known as 'p' value) has been used. This statistic would help us know if the equation on an overall basis is significantly fit

enough. The 'p' value generated in SPSS analysis helps us to accept or reject the null hypotheses. In the present study null hypotheses have been tested at 5% significance level and therefore, if the 'p' value is less than 0.05, then the null hypothesis is rejected and concluded that the model holds significant. In other words, this in the present study means that capital structure pattern would depend on assets structure, profitability, growth opportunities, liquidity, company size and dividend policy factors wherever relevant. Testing this at 5% significance level, if the 'p' value for the 't-test' is less than 0.05, then the null hypothesis is rejected. Apart from these statistics, Standard Error term (or simply S.E) have been used to analyze the results. Standard error indicates the variance in the mean values and therefore higher the standard error, more erroneous and less reliable.

### Explanation of Variables

This paper is analyse capital structure determinant on the basis of the review of literature. Rajan & Zingles (1995) and Ali, M.S. *et al.* (2013) use tangibility of assets structure, size of firm, growth (GR1 & GR2), profitability (PF), liquidity and dividends payout (policy) of the firm as explanatory variables to calculate the degree of leverage (Table 1). On the basis of existing review hypotheses is to be drawn below and also specifies in table 1.

### Hypotheses

On basis of previous empirical results, we have developed the following hypotheses to analyze the impact of tangibility, size of firm, tax, profitability, liquidity, non-debt tax shield and cost of debt on leverage.

H01 = The fixed assets of a firm does not have positive relationship with leverage.

H02 = The profitability of a firm does not have negative relationship with leverage.

H03 = The growth (GR1) of a firm does not have negative relationship with leverage.

H04 = The growth (GR2) of a firm does not have negative relationship with leverage.

H05 = The size (SZ1) of a firm does not have positive relationship with leverage.

H06 = The size (SZ2) of a firm does not have positive relationship with leverage.

H07 = The Dividend Policy of a firm does not have positive relationship with leverage.

H08 = The Liquidity of a firm does not have negative relationship on the leverage.

### Analysis & Findings

The results & analysis are following in manner, descriptive analysis and correlation matrix of dependent and independents variables are specifies in table 2, table 3 and table 4.

**Descriptive Analysis:** Table (2) In given table mean is high in GR2 which means log of sale is around 300 normally each year. On the other hand mean of DR, debt ratio is very low i.e. around .5, which shows that average debt ratio of the NSE Nifty index is 1:2, and having low volatility in the market, i.e. .09 (approx) and very low in the variance. Skewness show that data is positive which means, data is positive skewed, on the basis is of kurtosis it is less than 3, so it is leptokurtic. LTDR is more than STDR which shows that long term financing is more popular and practical in the Indian market than short term capital. In Short Opportunities (GR2) give highest mean i.e. 300.83 with the highest SD and Variance and followed by Dividend. LTDR and SZ have negative values.

Table (3) shows the correlation matrix for the variables in order to examine the correlation between the explanatory independent variable. Several correlations are noteworthy. First, we can see that tangibility is positively correlated

with growth 1, and negatively correlated with the profitability. On other hand, growth happened marginally i.e. by installing new investment for increasing production. Unless a new investment is in placed the growth in terms of assets remains stagnant. On the other hand by increasing capacity utilization production and sales increase and the asset's value decreases due to depreciation. That is why we found a positive correlation between growth (GR1) and profitability and also negative correlation with firm size (SZ1 natural log of sales) and liquidity. Many research studies tested the correlation between all variables (dependent and independent); concluded that high positive correlation exist highest negative correlation were between sz2 and the gr2. This paper run also a correlation matrix for both variables dependent and independent (Table 3). The matrix is used to detect any multi collinearly among the variables; the highest correlation factor equal to 0.46 recorded between the aggregate Long term debt ratio (LTDR) and Debt Ratio (DR) while the highest negative correlation equal to -0.896 was recorded between short term debt ratio and long term debt ratio.

Analysis of Determinants and testing of hypothesis (table 4).

**Assets Structure (Tangibility):** The most significant factor in explaining the variations in capital structure of Indian companies is tangibility (assets structure); the positive relation of the coefficient for the assets structure indicates that the Nifty firms are relying on their tangible assets to raise debts using their assets as collateral. The results are in line with Rajan and Zingales (1995), the coefficient of tangibility in the aggregate debt ratio is (.0270) with the short term debt ratio model while the coefficient is statically insignificant in the long term debt ratio (.166). It is interesting that the coefficient is positive for total debt which shows that banks are more

reluctant to lend firms tangible firms irrespective of the long term debt or most likely that.

**Profitability:** The long term debt ratio LTDR regression models indicate a positive relation the profitability coefficient (0.17). The result supports the pecking order theory (POT) and in line with previous empirical research of Rajan & Zingales (1995) and outline with pecking order theory prediction which urges that external finance is costly to the firms and Nifty firms tend toward external sources of finance. Although the other two ratio regression models indicate a positive (in long term debt) and negative in short term debt (-.011) relation of the profitability coefficient. In general, the negative relation between leverage and profitability is consistent in all underdeveloped debt market. The coefficient of profitability of DR is positive (.006) but less form the coefficient of LTDR.

**Growth:** The GR1 of variable of growth factor was found to be positively related in the aggregate debt ratio (.0003) & GR2 was found to be negatively related in the aggregate debt ratio (-2.40). which suggests that firms in the Nifty use more external debt financing than equity financing, in other word the growing firms need a huge cash flow which may not be able to meet through internal resources and consequently they use more external debt financing rather than equity. In analyzing the aggregate debt ratio into short term and long term, the regression model of short term debt indicates an inverse relation in GR2 & positive relation GR1 variables and a positive relation in GR1 & inverse relation GR2 in the long term debt ratio . The coefficients of the growth measured as percentage change of total sales were found statistically insignificant in the aggregate debt ratio model ( t-statistics is -1.84) and also remain insignificant in both the short term debt ratio model ( t-statistics = -1.215) and

the long term debt ratio model ( t-statistics = - 1.99) , while the coefficients of the growth variable measured as percentage change of net revenue from sales were found statically significant in both the aggregate debt ratio model ( t-statistics = 3.194) and long term debt ratio model ( t-statistics = 2.495) remain insignificant in the short term ratio model ( t-statistics = -1.169).

**Size:** The Size1 is positively correlated with debt ratios across all models. The results are consistent with Rajan & Zingales (1995) view of less asymmetric information tends to be less severe for larger firms than smaller firms and hence large firms find it easier to raise funds by debt financing. In addition, larger firms might be more diversified and bankruptcy less often which encourage the firm to borrow more. Although the signs of the coefficients of size variable confirms the direction of the relationship of size and indebtedness, the statistical significance of the coefficients remain low.

**Liquidity:** The coefficient of liquidity indicates a negative relation with debt ratios (.005). The negative coefficient of profitability along with negative coefficient of liquidity confirms that firms' profitable cash rich firms rely on debt financing for new investment plans for. The liquidity is supposed to be negatively correlated as it calculated on the basic of current ratio. Liquidity shows positive relation with the long term debt, whereas negative with the short term debt as well as total debt ratio.

**Dividend Policy:** It is worth mentioning that the coefficient of the dividends policy recorded a positive relationship only with the short debt ratio regression models (.0018) with t-stat (-8.33). The dividend policy is related to the investment decision firm funds not needed to finance projects. As per to POT (pecking order theory), firms tend to finance investments initially from retained earnings rather than using external funds. This tendency led the firm to adopt dividend policy accordingly. That is why a positive relationship between payout ratio and debt can be expected.

#### Summary Tables

**Table (1): Summary of Expected Results**

##### Where

"+" means that leverage increase with the determinant

"-" means that leverage decrease with the determinant

Determinants	Proxy used in this Study	Expected Relationship	References for Results
Tangibility of Assets	Fixed Assets/ Total Assests	+	Titman and Wessels (1988) & Rajan and Zingales (1995)
Profitabilty	Operating Profit/ Net Revenues From Sales	-	Rajan and Zingales (1995)
Growth(GR1)	% Change of Total Assets	-	Titman and Wessels (1988) & Rajan and Zingales (1995)
Opportunities(GR2)	% Change of Net Revenues from Sales	-	Rajan and Zingales (1995)
Size(SZ1 & SZ2)	Natural Log of Total Assets	+	Rajan and Zingales (1995)
	Natural Log of Sales	+	Rajan and Zingales (1995)
Dividend Policy	Dividend / Net Profit	+	Rajan and Zingales (1995)
Liquidity	Current Assests/ Current Liabilities	-	Myers, Stewart C. (1977), Titman and Wessels (1988) & Rajan and Zingales (1995)

DR= Total Liabilities / Total Liabilities + Net Worth,

Assets Structure (TANG)= FA/ Total Assets, Profitability(PF) = Operating Profit/ Net Revenue from sales, GR1= % Change of Total Assets, GR2= % Change of net revenues from sales, SZ1= Natural Log of Total Assets, SZ2= Natural log of sales, Dividend Policy (DIV)=Dividend/Net Profit, Liquidity (LIQ)=Current Assets/Current Liabilities.

**Table(2) Summary Statistics of Capital Structure**

	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
DR	0.59	0.00	0.10	0.01	1.40	0.12	1.56	0.24
LTDR	0.38	0.01	0.22	0.05	-1.69	0.12	6.28	0.24
STDR	0.21	0.01	0.19	0.04	2.32	0.12	7.19	0.24
TANG	0.36	0.01	0.25	0.06	0.56	0.12	-0.25	0.24
sz1	4.05	0.03	0.53	0.28	0.05	0.12	-0.25	0.24
GR1	24.66	2.29	44.17	1951.13	10.94	0.13	163.31	0.25
Liq	1.24	0.09	1.82	3.32	7.35	0.12	67.71	0.24
sz2	3.94	0.03	0.69	0.47	-1.64	0.12	6.84	0.24
GR2	300.83	162.79	3148.18	9911035.94	13.90	0.13	215.42	0.25
Div	31.18	1.36	27.70	767.11	4.49	0.12	36.94	0.24
PF	2.08	0.36	7.29	53.15	15.48	0.12	253.84	0.24

(Source: SPSS Software)

**Table (3): Correlation Matrix of the Dependent & Independent Variables**

Correlations											
	DR	LTDR	STDR	TANG	sz1	GR1	Liq	sz2	GR2	Div	PF
DR	1	.461	-.021	-.028	.241	.068	-.238	-.055	-.068	-.077	.100
LTDR	.461	1	-.896	-.270	.337	.113	.054	-.235	.009	-.231	.056
STDR	-.021	-.896	1	.291	-.260	-.094	-.180	.238	-.044	.222	-.013
TANG	-.028	-.270	.291	1	-.189	-.079	-.216	.279	-.127	.059	.096
sz1	.241	.337	-.260	-.189	1	-.109	-.043	.409	.049	-.151	-.036
GR1	.068	.113	-.094	-.079	-.109	1	.047	-.031	-.036	-.124	-.030
Liq	-.238	.054	-.180	-.216	-.043	.047	1	.014	-.024	-.016	-.053
sz2	-.055	-.235	.238	.279	.409	-.031	.014	1	-.300	.028	-.070
GR2	-.068	.009	-.044	-.127	.049	-.036	-.024	-.300	1	.035	-.020
Div	-.077	-.231	.222	.059	-.151	-.124	-.016	.028	.035	1	.434
PF	.100	.056	-.013	.096	-.036	-.030	-.053	-.070	-.020	.434	1

**Table (4): Output Summary of the DR, LTDR & STDR**

Included observations: 360 after adjustments									
Variable	DR			LTDR			STDR		
	t-Statistic	Std. Error	Prob.	t-Statistic	Std. Error	Prob.	t-Statistic	Std. Error	Prob.
TANG	8.166136	0.033147	0	1.305305	0.079561	0.1926	2.082024	0.080128	0.0381
GR1	3.194838	0.000101	0.0015	2.498892	0.000243	0.0129	-1.159607	0.000245	0.247
GR2+10*DR	-1.841048	1.30E-06	0.0665	-1.991325	3.13E-06	0.0472	1.215653	3.15E-06	0.2249
SZ1	15.37661	0.010074	0	14.79265	0.024179	0	-8.327167	0.024352	0
SZ2	-9.547566	0.009144	0	-12.02958	0.021948	0	7.994954	0.022104	0
LIQ	-2.777302	0.001943	0.0058	2.342267	0.004664	0.0197	-3.474593	0.004697	0.0006
PF1	3.612671	0.001687	0.0003	4.231652	0.00405	0	-2.707266	0.004079	0.0071
DIV1	-2.134472	0.000156	0.0335	-5.793342	0.000374	0	4.8694	0.000377	0

## CONCLUSION & SUMMARY

On the basis of analysis we can conclude that there are different factors that affect the Nifty capital structure, the Nifty firms are preferring external debt financing in the recent years. The analysis suggests that In Nifty forms are more willing to use external

financing in the last decade compared to earlier year of stock market transition. These factors also affected the variable of Nifty 50 Index. The firms are more preferred the external debt financing over the internal debt due to having negative coefficient. That's why, low liquidity tend to external financing in Nifty. This results support the Tradeoff theory. The theory urges

that internal finance are less available due to low liquidity and firms prefer to rely on external finance, and hence companies with low liquidity tend to adopt external financing.

In general, the signs of coefficients for asset structure (tangibility) profitability, growth opportunities and size suggest that the pecking order theory doesn't hold for the Nifty 50 companies examined and the results seem to confirm the trade-off theory. In addition, the findings show that Indian companies as well as Nifty tend toward external financing over other options of funding like internal financing and short term borrowing. Long-term financing is well preferred since the debt market in the country is developed cause of liberal government policies. The paper examined the determinants of the capital structure for a Nifty non-financial firms for a 10-year period 2004-2013, in general the data suggests that Nifty Non-financial companies are moving towards external financing in recent years, thus the leverage ratios are remain low compared to those in developed countries. This paper studies the leverage decisions of Nifty 50 Index. Six major factors (tangibility, firm size, growth, profitability, liquidity and dividend policy) are identified and their relations to leverage are studied. The results are mostly consistent with much of the previous literature. We find that leverage increases with increase in Firm Size, profitability and Growth. In contrast, we found that leverage increases with decrease in tangibility and liquidity. As India is a developing country, there are various factors & techniques developed day by day like corporate governance and other compliance codes by the Capital Market Authorities in the region, the quality and availability of information of the stock market data is improving in the last couple of years, therefore it is expecting that more in-depth empirical studies could be carried out about the capital structure of the India and other Asian developing countries

which will help better understanding of the corporate financing and investment decision.

## REFERENCES & BIBLIOGRAPHY

1. Brav (2009), *Access to Capital, Capital Structure, and the Funding of the Firm*, Journal of Finance, Vol. 64 Issue 1, Pp.263-308.
2. Chen, J. J. (2004). *Determinants of capital structure of Chinese- listed companies*. Journal of Business Research, 57(12), Pp.1341- 1351.
3. Jensen, M. and Meckling, W. (1976). *Theory of the Firm: Managerial Behaviour, Agency Costs, and Ownership Structure*. Journal of Financial Economics, Pp.305-360.
4. Jensen, M. (1986). *Agency cost of free cash flow, corporate finance and takeovers*. American Economic Review Papers and Proceedings, 76, Pp.323-329.
5. Jianjun Miao (2005), *Optimal capital Structure and Industry Dynamics*, Journal of Finance, Vol. LX, No. 6, Pp. 2621-2659.
6. Korajczyk, R.A., Levy, A., (2003). *Capital structure choice: Macroeconomic conditions and financial constraints*. Journal of Financial Economics 68, Pp.75-109.
7. Lubatkin, M. and Chatterjee, S. (1994). *Extending modern portfolio theory into the domain of corporate diversification: Does it apply?*, Academy of Management Journal, 37, Pp. 109- 136.
8. Modigliani, F. and Miller, M. (1958). *The cost of capital, corporation finance, and the theory of investment*. American economic Review 48, Pp.261-197.
9. Modigliani, F. and Miller, M. (1963). *Corporate income taxes and the cost of capital: A correction*. American economic Review, Pp.433-443.
10. Myers, S., and N. Majluf (1984) *Corporate Financing and Investment Decisions When*



- Firms Have Information Investors Do Not Have*. Journal of Financial Economics 13, Pp.187–222.
11. Rajan, R.G., and L. Zingales, (1995), *What do we know about capital structure? Some Evidence from international data*, Journal of Finance, 50, Pp.1421-1460.
  12. Berle, A.A. and Means, G.C. (1932). The Modern Corporation and Private Property. The Macmillan Company, New York, NY.
  13. Elliot, B. and Elliot, J (2002). Financial Accounting and Reporting. 12th ed. London: Prentice Hall/Financial Times.
  14. Pinegar, M. and Wilbricht, L. (1989). What Managers Think of Capital Structure Theory: A Survey. *Financial Management*, Winter, pp. 82-91.